Digitalisation in Tourism

In-depth analysis of challenges and opportunities

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Executive summary

Digital technologies have brought significant transformation to the tourism industry, revolutionising tourism enterprises, products and experiences, business ecosystems, and destinations. Digitalisation has also transformed the traditional roles of tourism producers and consumers, with new roles, relationships, business models, and competencies emerging. The rise of digital platforms has increased the variety and volume of tourism products, services and experiences, with on-demand functionality accelerating the speed of economic transactions, market awareness and feedback. These shifts have created new opportunities, as well as challenges, for tourism SMEs as they strive to meet consumer demands, and reach new markets. Coordinated efforts to foster an innovative digital culture in tourism SMEs can ensure European destinations are globally competitive. The diversity and complexity of tourism's sub-sectors, the different challenges in urban, rural, and island destinations, and the different challenges that manifest in different institutional systems across Europe, present capacity-building and regulatory challenges for the digital tourism ecosystem.

The objective of this report was to analyse the challenges and opportunities of digitalisation in tourism, how these challenges and opportunities affect different stakeholder groups, and to discuss how they might be addressed. The authors drew from a quantitative survey of 2.897 SMEs, 73 public administrations, and 85 professional associations conducted in 2016 by third-party consultants. This current analysis was conducted under a separate tender procedure and draws from additional secondary data sources, qualitative interviews, and scholarly research.

Needs of tourism SMEs

Skills. The digital competencies of the tourism labour force will play a key role in the successful uptake of digitalisation in tourism. SMEs however often lack the necessary technical resources in their workforce to fully realise digital potentials. This can be due to a number of factors ranging from a lack of knowledge in identifying required digital skills to limited staffing issues, restricting the time and effort which can be applied to learning new digital processes.

Finance. Lack of finance is identified as the number one obstacle preventing the implementation of digital technologies in tourism SMEs. There is a significant concern amongst tourism enterprises that the cost of implementing new digital technologies will not be offset from the gains.

Infrastructure. The geographic location of tourism enterprises greatly affects their access to adequate digital infrastructures. SMEs in urban settings benefit from modern wireless and fibre broadband connections whereas the infrastructure in rural or more remote areas is often deficient.

Mentoring support. Mentoring initiatives can boost innovation, enhance creativity and ideation, assist with capacity building, and improve connectivity between tourism enterprises, tech companies, the arts and cultural sector, and other start-ups. Mentoring reduces the distance, and improves the timeliness, of advice between those that have the expertise and those that need to learn.

Policy support. Policy initiatives and actions are needed to support SME awareness of new technologies and make clear the benefits of their implementation. Furthermore, SMEs require support in their business planning and decision-making with regards to new technologies to ensure efficient utilisation.

Recommendations

Policy responses should build on the knowledge network and cluster development instigated by public authorities and professional associations. Furthermore, their continued consultation can help strategically focus digital policies to the appropriate e-business, e-commerce and e-governance needs of SMEs at local, regional and nation levels.

Technical assistance in the form of digital training should be targeted to different groups of SMEs including those just start to digitalise and are moving into e-business; those that are in transition to e-commerce; and those that are highly digitalised and experimenting with new technologies. This form of technical assistance also ties in with aspects of lifelong learning and the digital empowerment of the workforce.

Access to reliable digital infrastructure must be promoted with a focus on fostering increased levels of digital literacy. Rural areas are particularly challenged in terms of access to digital infrastructure.

Digital research and development should incorporate smart growth strategies to secure long term thinking and promote sustainable practices. This requires collaboration with additional industries and integrating tourism-related activities into the wider economic value chains of a destination.

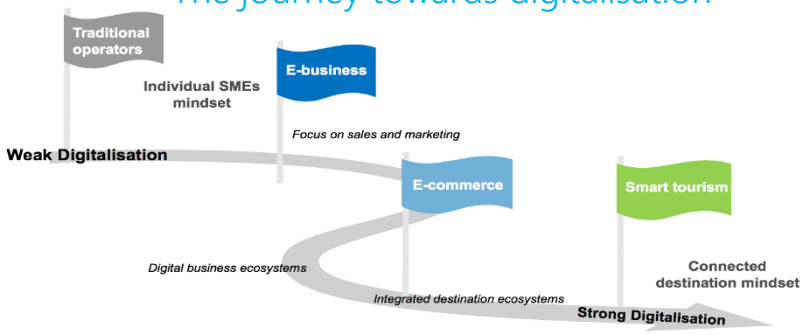
Digitalisation in Tourism

Challenges and opportunities

Digitalisation in Tourism

- Leads to creativity and innovation in tourism
- Facilitates increased customisation of visitor experiences
- Enhances visitor satisfaction
- Contributes to new destination configurations
- Inspires new business models, new value chains, new business ecosystems
- Opens up new roles for consumers and producers (i.e. prosumers)
- Prompts new roles for DMOs to support SMEs

The journey towards digitalisation



Traditional operators
Traditional business practices, low levels of digitalisation focused on internal operations and creating value for tourists

E-business
Digitalisation improves internal operations, engage more effectively via digital marketing, online stores

E-commerce
Growing interconnectivity, incorporates diverse intermediaries, innovation across supply chains, B2B, B2C, C2C transactions

Smart tourism
SMEs buy into smart destination vision, high level of innovation, real time connections, new/innovative products, business models, connections into global value chains

SME opportunities, difficulties, motivations and obstacles

	Top 5 OPPORTUNITIES expected from digital technologies on SME operations (Q3)	Top 5 DIFFICULTIES in implementing digital technologies (Q4)	Top 5 MOTIVATIONS why SMEs seek to digitalise (Q10)	Top 5 OBSTACLES in further implementing digital technologies (Q12)
1	Customer acquisition	Training on new digital technology	Improving online presence for competitiveness	Lack of finance
2	Improve online brand visibility	Costs and uncertain return on benefits	Improving growth	Current technology level is sufficient
3	Expand international reach	Insufficient knowledge to identify opportunities	Optimistic about future opportunities	High training costs
4	Improve service quality	Insufficient technical knowledge	Addressing seasonality	Rapid pace of technological change
5	Increase visitor satisfaction	Lack of suitable "off the shelf" products within budget	Improving networks	Cost of high speed broadband

Policy responses

- Network capacity building - inclusion of stakeholders beyond tourism.
- Technical assistance - education and skills training.
- Financial assistance - training costs and access to off the shelf products.
- Research & Development - Innovative solutions and smart growth.

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1.0 BACKGROUND

Digitalisation leverages digital technologies and data to transform businesses and business ecosystems. It transforms markets and production processes, and has significant implications for economic and social organisation, innovation, and competitiveness. In tourism, digitalisation presents opportunities for SMEs to expand their market reach, increase growth, improve operational efficiencies, and sharpen their competitive edge. At a collective level, it can also help to develop and customise product offerings, improve destination connectivity, generate data to track performance, and help to improve destination management. In 2014, there were approximately 2.3 million tourism enterprises in the E.U., with the majority being small and medium sized enterprises (SMEs). These SMEs employed some 12 million people, which is approximately 9% of total employment in the non-financial business economy[1]

Due to the very traditional nature of tourism and hospitality, digitalisation brings with it a range of challenges and opportunities for SMEs. The tourism sector is highly fragmented, and subsectors such as transport, accommodation, restaurants and catering, and personal services are all subject to very different challenges and opportunities when it comes to digitalisation. There are significant differences in human resource capabilities, varying levels of access to financial and non-financial resources, different levels of awareness, and variations in digital skills. Moreover, in the tourism system, the challenges and opportunities that individual businesses encounter become magnified, distorted, and amplified both in business ecosystems, and at the collective destination level.

***Digitalisation** provides the tools, frameworks, and technologies to create and/or add value to tourism products and experiences but the success of digitalisation depends on the capacity of the tourism sector to share, learn and collaborate.*

Over the long term, digital transformation can unlock innovation and ensure the competitiveness of European destination systems. However, it is important to recognise that digitalisation offers tools, frameworks, and technologies to create and/or add value to tourism products and visitor experiences, but that these can only be successful if built upon a strong tourism sector. These foundations include an industry that is well connected, that shares similar strategic values, with the capacity to share information, establish and maintain supportive mentoring opportunities and partnerships, and that nurtures opportunities to learn, reflect and grow.

Given that SMEs make up a large proportion of the tourism system, the challenge is clear. Securing competitive advantage, enhancing the connectivity and efficiencies that digitalisation promises, and unlocking the innovative potential of new products, services and experiences, is dependent upon a vibrant, visionary, and collaborative tourism sector.

While much attention has been placed on digitalisation in the manufacturing and industrial sectors, less attention has been placed on understanding the challenges and obstacles in tourism, and what types of policy responses and interventions might be appropriate to assist digitalisation in different parts of the tourism sector and in different stakeholder groups.

Objective of this Report

The objective of this report is to analyse the specific challenges and opportunities of digitalisation in tourism, how these challenges and opportunities affect different stakeholder groups, and to identify the needs of industry and member states in addressing these aspects. This report helps to identify potential European tourism policy approaches and initiatives to enhance digitalisation in tourism.

To address this objective, the authors of this report were asked to draw from a quantitative survey of 2.897 SMEs, 73 public administrations, and 85 professional associations conducted in 2016 by third-party consultants[2]. This

[1] Eurostat https://ec.europa.eu/eurostat/statistics-explained/index.php/Tourism_statistics
[2] The present authors were provided this data to interpret but had no input into the survey tool, methodology or application.

current analysis was conducted under a separate low value tender procedure[3] and draws from additional secondary data sources, qualitative interviews, and scholarly research as detailed within this report.

Three key questions provide the broad focus of this report:

- What are the challenges and opportunities of digitalisation in tourism? (Section 3)
- What is being done? (Section 4)
- What policies and actions might be appropriate to facilitate digitalisation in tourism? (Section 5)

The survey, data collection and analysis

The analysis contained within this report is based on survey data supplied by the European Commission. The development of the survey instrument, the data collection, and initial analysis were undertaken by a third party. The data collection process targeted three groups of respondents: Tourism SMEs, public administrations, and professional associations, and data was collected in mid-2016[4].

In the first data set, a questionnaire was designed for public administrations and professional associations/federations. A total of 158 valid responses were received from public administrations (n=73) and private associations (n=85). The questionnaires were differentiated to reflect the different roles and responsibilities of each group but were aligned to explore similar issues. Three types of information were collected:

1. Descriptive characteristics of the respondents.
2. Information about exercises carried out to assist digitalisation by SMEs.
3. Perceptions of the impact of digitalisation.

The second set of data was gathered through online surveys targeted at tourism SMEs and micro-enterprises (n=2.897). Although the Digital Tourism Network Steering Group played an initial role in generating questions and provided initial advice on the questionnaire design, the selection of key lines of enquiry was ultimately made by the original Consortium Research Team. Members of this team then devised a potential pool of respondents corresponding to each of the 28 member states.

Data collection involved the use of Computer Assisted Telephone Interviewing (CATI) and Pen and Paper Assisted Interviewing (PAPI). The online surveys for tourism SMEs and micro-enterprises aimed to establish:

1. The technologies and steps SMEs had taken towards digitalising their business.
2. The expected results and benefits to customers of these digitalisation initiatives.
3. The obstacles for implementation of new digital solutions.

In the following analysis the data is presented and explained, supplementary analysis has been undertaken to shed light on aspects including whether there were any factors that could explain the level of digitalisation of SMEs; whether levels of digitalisation were different in different institutional systems; and whether there were any factors that affected SMEs' intention to digitalise. Qualitative interviews have also been undertaken with actors in all three stakeholder groups and will be the subject of a later report. For the purpose of this report by the current authors, these interviews have been used to expand, corroborate or explain the findings from the survey data.

[3] GRO-SME-17-C-091-A Very Low Value procedure GRO-SME-17-C-091-A Virtual Tourism Observatory In-depth analysis of the challenges and opportunities of digitalisation in tourism

[4] Further information is contained in European Commission (2017). Management and Content Provision for ICT and Tourism Business Support Portal. Final Report. (Tender No. 2014/S 251-445667)

2.0 Digitalisation in tourism

Europe's single digital market

The Single Digital Market Strategy for Europe[5] provides the key directions for digitalisation transformation of Europe's economy by unlocking the full potential of a single European market, and by supporting the free movement of goods and services across Europe's internal borders. Historically, variations in policy frameworks and regulation in member states have contributed to uneven challenges and opportunities for business development. The Single Digital Market Strategy addresses this fragmentation and associated barriers to the development of Europe's digital economy through:

- Creating better opportunities for consumers and businesses to access online goods and services across Europe.
- Encouraging the right conditions for digital networks and services to flourish.
- Maximising the growth potential of the European Digital Economy.

In addition, the European Commission targets its support for tourism towards four sets of initiatives aimed at:

- **Improving the business environment** and **enhancing investment in the tourism sector**, through the better use of available EU financing opportunities.
- **Boosting digitalisation** and the use of online marketing and distribution tools within the industry to meet new trends and consumer expectations.
- **Enhancing the skills and competences of the tourism sector** in order to improve career prospects and support the industry to find and retain professionals with the right skills.
- **Raising the profile of Europe** as a tourism destination with the aim to complement promotional efforts at national and regional level and to attract more tourism flows to Europe, particularly from key third countries' source markets.

The Digital Single Market ensures the free movement of goods, persons, services and capital, where individuals and businesses can seamlessly access and exercise online activities under conditions of fair competition, and a high level of consumer and personal data protection, irrespective of their nationality or place of residence. Achieving a Digital Single Market will ensure that Europe maintains its position as a world leader in the digital economy, helping European companies to grow globally.

The challenge of creating a European policy environment that facilitates the Single Digital Market is underscored by the OECD's finding that the European digital market is made up of 54% US-based online services, 42% of national online services, and 4% European Union cross-border services[6]. The European Commission's role is to address barriers to the single digital market, and to streamline its development. The task of creating and maintaining a supportive policy and regulatory environment that facilitates digitalisation falls to tourism organisations and public administrations in member states. According to an OECD survey of the top 10 challenges to digitalisation across 31 countries, the 3 most prominent challenges for governments were:

- lack of awareness, implementation and enforcement.
- insufficient skills, training and education.
- multi-actor, multi-stakeholder and multi-level governance coordination[7].

That said, varying levels of expertise, availability of capital, infrastructure availability, cost and reliability, access to talent, and capacities of business ecosystems result in uneven opportunities for digitalisation. In tourism, this is further exacerbated by the large proportion of SMEs that characterise the tourism sector, and the particular characteristics of the sector including the relatively conservative (i.e. traditional and low risk) nature of tourism operators, fluctuations in productivity caused by seasonality, and high levels of casual and seasonal labour.

[5] European Commission. A Digital Single Market Strategy for Europe {SWD(2015) 100 final} March 2015. Brussels.
[6] OECD Digital Economy Outlook (2017). (p.35) http://dx.doi.org/10.1787/9789264276284-en
[7] ibid. (p.37) http://dx.doi.org/10.1787/9789264276284-en

The rise of the digital economy and tourism

Industry 4.0 is the term used to capture a number of trends occurring in the manufacturing sector driven by digitalisation, including automation, increased interconnectivity between cyber and physical systems, and increased management efficiencies provided by big data analytics and cloud computing[8]. Now spreading well beyond the manufacturing sector into other parts of the economy, Industry 4.0, together with its counterpart Business 4.0 which seeks to transform business practices through digitalisation and open innovation, is the dominant paradigm disrupting, reshaping and transforming industrial systems and economic production. Tourism, which exhibits characteristics of both industry and the service sector, is undergoing massive transformation as a result of advances in information technologies and processes of digitalisation.

Three key phases of technology development can be identified in tourism[9].

Phase 1
Sales and marketing

In the last decade of the 20th century (1990-2000), the introduction of the Internet enabled destination organisations and businesses to harness technology as a marketing tool. Digital point-of-sale and supporting software helped SMEs improve internal operations. Websites began to replace paper-based marketing materials, destination management organisations became "information brokers", web-based reservation systems started to facilitate business transactions, and distribution systems facilitated increased coordination across the industry.

Phase 2
Digital business ecosystems

Between 2000 and 2010, the Internet consolidated its place as the key source of information for travellers, and advances in Internet technologies enabled a virtual marketplace where products and services could be searched, compared, and transacted (i.e. purchases, shared, swapped, etc.) online. A shift in emphasis from products to the visitor experience meant that suppliers became increasingly interested in customising products and developing personal connections with their customers. Innovative online intermediaries emerged such as Expedia, disrupted the traditional travel agency business model, and growth of review sites like TripAdvisor put the customer in control of their purchases but also gave them an influential role in the decision making of future consumers. Visitor Information Centres saw a decline in their role as point of contact, and tourists increasingly booked and completed electronic transactions online, which in turn facilitated the expansion of global markets.

Phase 3
Integration of systems

From 2010, advances such as cloud computing, mobile and wearable technologies, augmented and virtual reality, GPS, and increased integration and interoperability of digital systems have facilitated interconnectivities between digital and physical worlds. Combined with collaborative social media platforms and Web 2.0 that facilitates user-generated content, these advances have opened up new and innovative product development opportunities that have accelerated the global reach of tourism enterprises.

[8] Smit, J., Kreutzer, S., Moeller, C., & Carlber, M. (2016). Industry 4.0. Policy Department A: Economic and Scientific Policy. Directorate General for Internal Policies. European Parliament.

[9] Xiang, Z. & Fesenmaier, D. (2017) Big data analytics, tourism design and smart tourism. In Analytics in Smart Tourism Design: Concepts and Methods. Cham: Springer (pp.299-307)

Examples of digital technologies transforming tourism

Phase 1. 1990-2000	Phase 2. 2000-2010	Phase 3. 2010 onwards
Electronic cash registers Financial software Mobile phones Email Intranet Internet banking Office software Video conferencing Websites Destination (city) cards	Smart phones Computer graphics software Property management systems Computerised ticketing systems Computerised stock control systems Online booking systems Customer reservation systems Email marketing Customer relationship systems	Augmented reality Virtual reality Mobile Apps Cloud computing and online data storage Wearable technologies Social media Google analytics Review websites Collaborative online environments Web 2.0 Chatbots and instant advice Peer production, e.g. platform collaborative economy; commons collaborative economy

Adapted from: Xiang, Z. & Fesenmaier, D. (2017) Big data analytics, tourism design and smart tourism. Cham: Springer

These developments, and associated transformations (below), necessitate new thinking about travel, new models of product development, new business practices and ecosystems, and new approaches to supporting and building capacity in tourism. Effective, targeted responses to digitalisation require a collaborative network and learning environment be established so that SMEs can be inspired by technology savvy businesses both in and outside tourism and can learn and collaborate together. The public sector and professional associations have important roles in establishing and nurturing this environment.

Transformations in tourism resulting from digitalisation

Disruption	New destination configurations	New business models, value chains, and ecosystems	Changing roles of consumers & producers	New roles for tourism organisations
Big data improves management Disruption to incumbent operators and pressure to reconceptualise traditional business models Rise of the platform economy, on-demand business New value creation opportunities Emergence of global value chains	Digitalisation allows greater customisation of visitor experiences, new customised destinations emerge	New actors such as online platforms act as information brokers and intermediaries (e.g. Expedia, TripAdvisor, etc) offer many services traditionally offered by tourism organisations. Digital platforms (e.g. Airbnb, Uber) are expanding beyond accommodation products to curate, coordinate, and facilitate visitor experiences in a destination.	Visitors have become prosumers actively producing and consuming their own experiences. They take on different roles, including booking, (self)guiding, reviewing, sharing and marketing the destination.	Destination marketing and product development, the traditional roles of tourism organisations, are transformed, and these organisations find themselves increasingly in facilitation and capacity building roles with less and less direct influence over destination development, innovation, and marketing.

External factors affecting digitalisation

A range of factors influence the uptake of digital technologies at local, national and global levels. These factors include social and demographic characteristics; the political context; legal frameworks; geophysical environments; availability of, access to, and awareness of different technologies; the economic conditions that shape confidence, investment and so on; what is happening in competitor environments; and influences on the marketplace[10]. These influences play out in different member states, in different destinations, and in different sub-sectors of tourism, giving rise to multi-speed processes of digitalisation. The design of policy initiatives should take into account these factors and not rush to adopt one-size fits all solutions from other destinations.

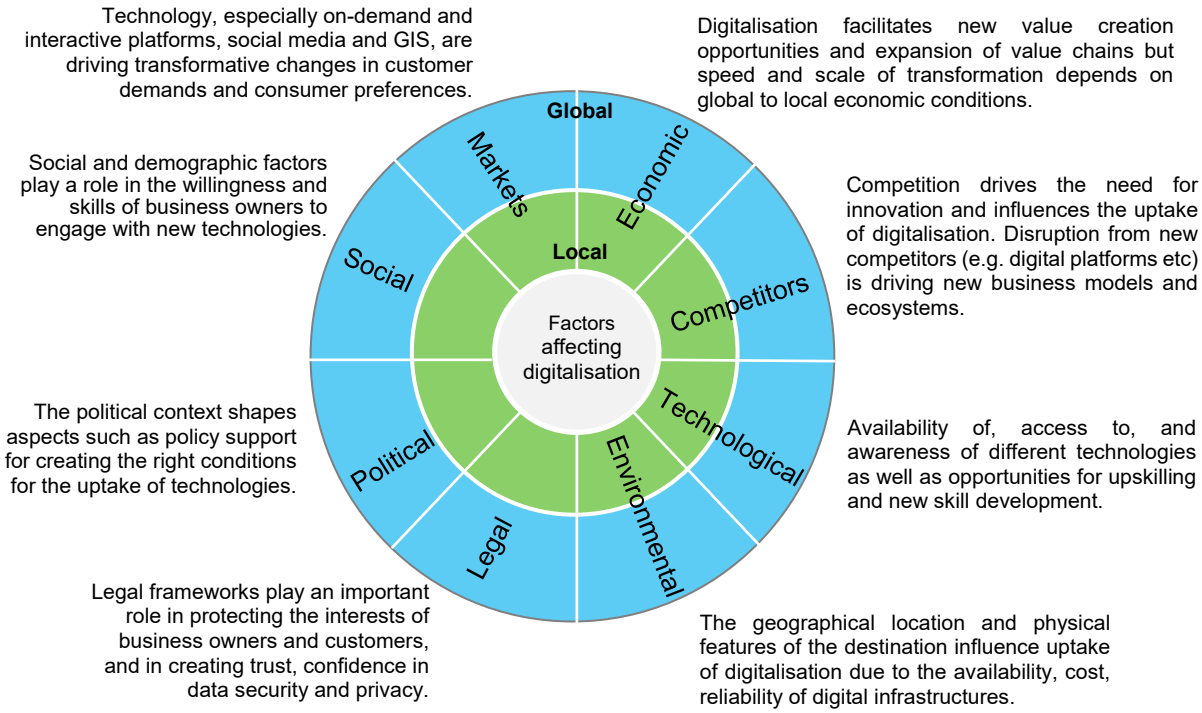
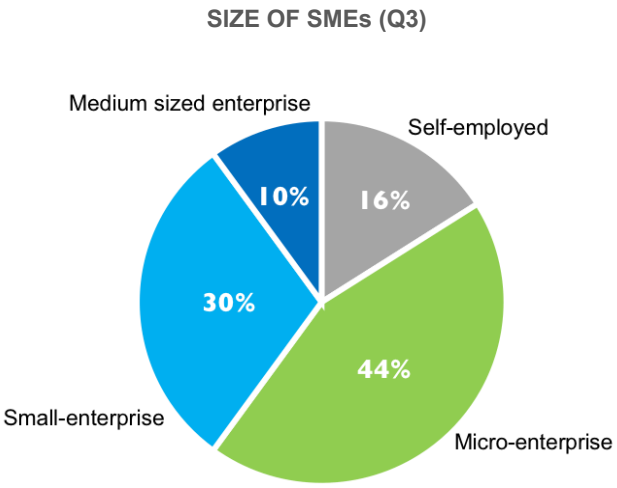


Figure 1: Factors influencing the uptake of digitalisation

[10] Derived from multiple references by authors.

3.0 Small and Medium sized Enterprises (SMEs)

Characteristics of SMEs



Size of SMEs. In total, survey responses from 2.897 tourism SMEs were obtained. A total of 60% were classified as micro-enterprise (less than 10 employees) and self-employed. Of the remaining sample, 30% were small enterprises (less than 50 employees) and 10% were medium-sized enterprises (less than 250 employees)[11].

Company category	Staff	Turnover or	Balance sheet
Medium	<250	≤ €50 million	≤ €43 million
Small	<50	≤ €10 million	≤ €10 million
Micro	<10	≤ €2 million	≤ €2 million

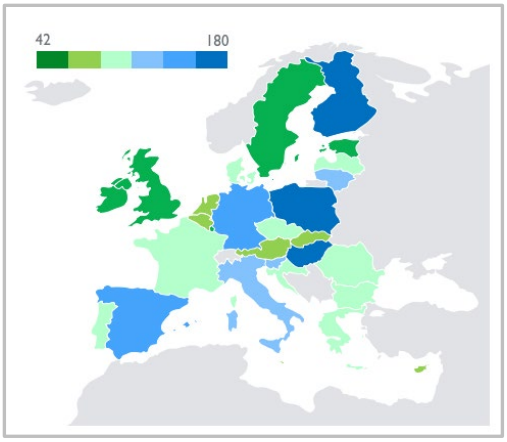
European Commission definition [5]

Geographical distribution. The geographic characteristics of SMEs greatly influence the challenges and opportunities they will face. SMEs in urban areas, and especially major cities, can benefit from dense networks, more opportunities to learn from other businesses, and greater partnering opportunities. SMEs in rural and regional locations generally have to invest more time and effort in developing networks. SMEs located in remote and peripheral locations may be disadvantaged by limited access to infrastructure, and the cost and reliability of digital broadband services. In this study, 51,7% of SMEs that responded to the questionnaire were located in urban areas, 33,6% were in rural areas, and 17,3% were in coastal areas. Only 11,7% of responses were from SMEs in island or mountainous areas. The map below demonstrates the number of replies received from the various Member States.

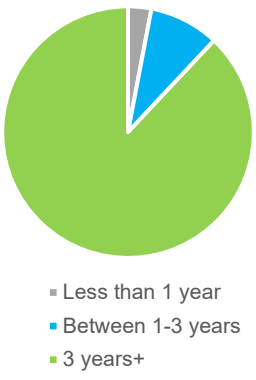
Length of operation. The majority of businesses have been in operation for three or more years (87,6%) with those in operation for less than one year (3,3%) representing only a modest fraction of the sample.

Subsector. The tourism sector is composed of a range of sub sectors e.g. accommodation, transport, catering, and guiding to name a few. It is also possible for tourism enterprises to be present in more than one sub-sector of the economy (e.g. transport and accomodation) further complicating their digitalisation challenges[12].

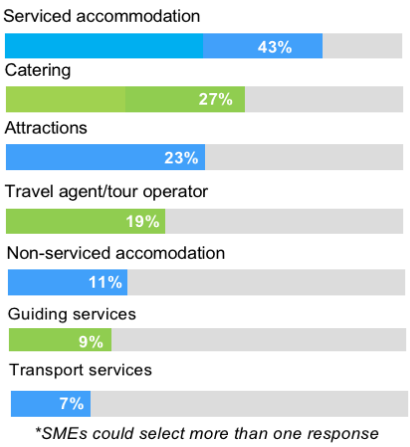
Geographical distribution (Q2)



Length of Operation (Q5)



SME by subsector (Q3)



[11] European Commission. What is an SME? http://ec.europa.eu/growth/smes/business-friendly-environment/sme-definition_en

[12] OECD. Small business, job creation and growth: Facts, obstacles and best practices. https://www.oecd.org/cfe/smes/2090740.pdf

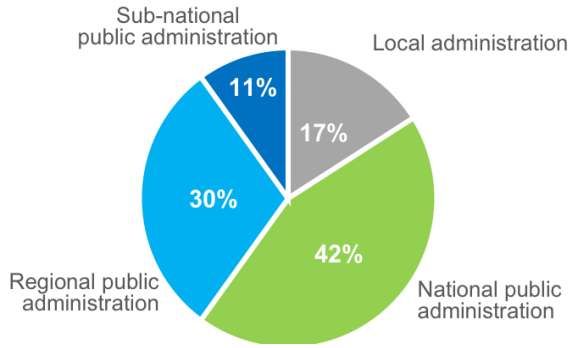
4.0 Public administrations and professional associations[13]

Characteristics of public administrations and professional associations

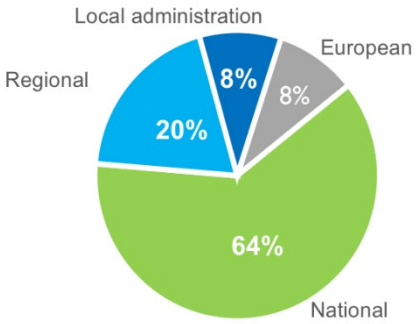
The survey of public administrations (n=73) was dominated by national agencies, followed by regional administrations. National public administrations made up 42% of the sample. These administrations can have an important role in driving national policy initiatives and in programme funding, but are often less involved in specific projects (other than co-funding) or in the technical aspects of digitalisation. Local agencies are likely to be best versed in the daily challenges and opportunities of digitalisation in SMEs.

Only 17% of the responses were from local administrations despite that these agencies often have the most direct role and hands-on knowledge in supporting digitalisation initiatives. European Commission research suggests that cities are often the launchpad for digital transformation via local support for impact hubs and start-up ecosystems, and that a wide range of initiatives are already taking place[14]. This suggests that this survey sample might not adequately capture local digitalisation initiatives that are taking place.

Type of public administration



Type of professional association

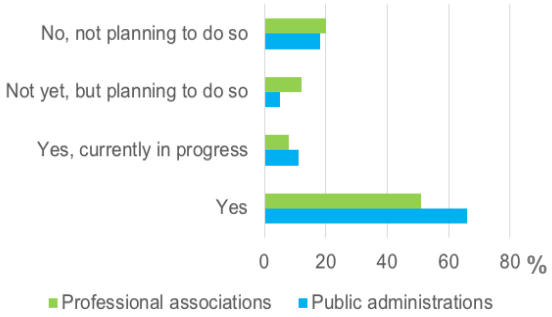


Level of activity to support digitalisation in SMEs

According to the survey data, both public administrations and professional associations were actively engaged in activities to support digitalisation in tourism SMEs.

76% of public administrations had completed or were actively involved in digitalisation initiatives.

65% of professional associations had completed or were engaged in digitalisation initiatives.

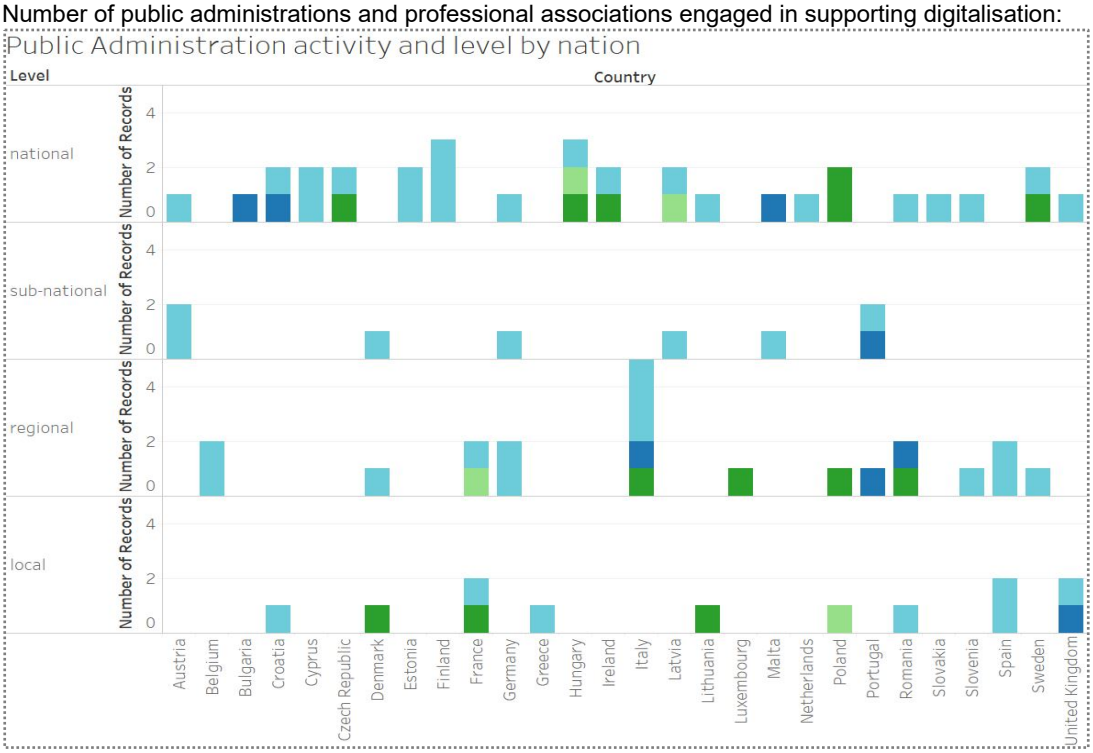


[13] The characteristics of public administrations and professional associations discussed in this section are based on the data supplied, which is not necessarily representative of all European local administrations in particular. Local administrations would be significantly more likely to be involved in hand-on initiatives than national and regional administrations and yet make up a small component (17%) of the sample.

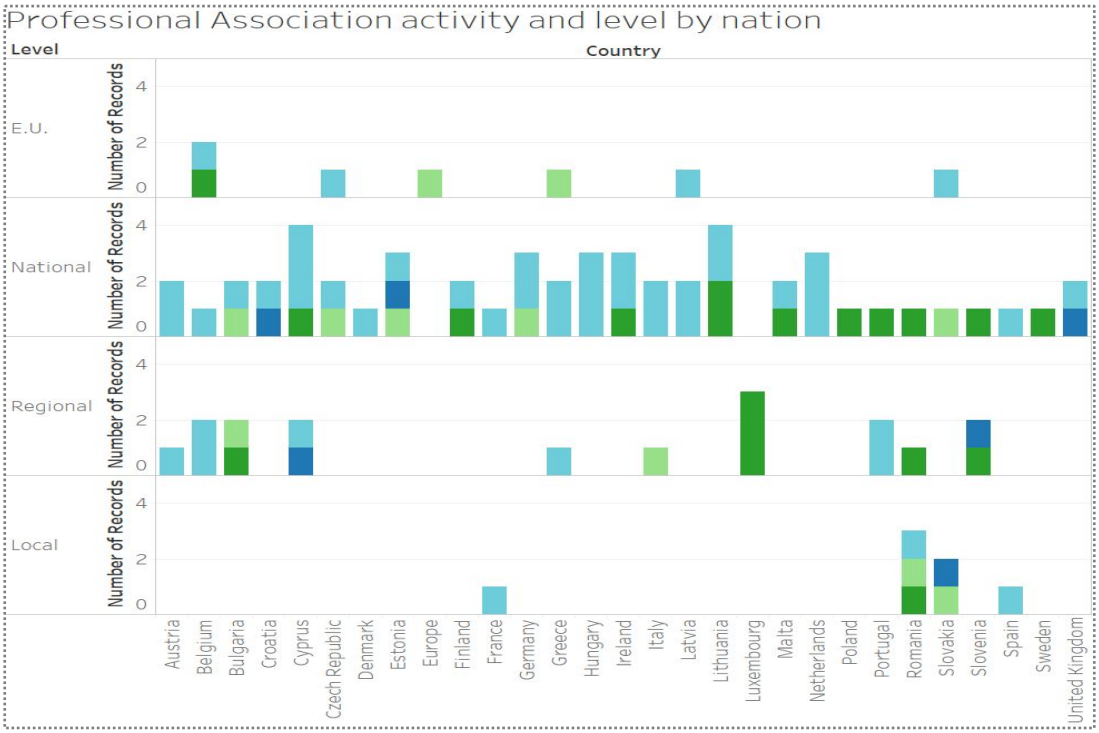
[14] European Commission (2016). Accelerating the digital transformation of European industry and enterprises. Key recommendations of the Strategic Policy Forum on Digital Entrepreneurship. https://ec.europa.eu/growth/industry/policy/digital-transformation/role-cities-regions_en

Public administration and professional association activity

Number of public administrations and professional associations engaged in supporting digitalisation:



Exercise
- Yes
- The exercise is currently in progress
- Not yet, but planning to do so in the future
- No, and currently not planning so either



Note: The small number of activities being conducted at the local level might not reflect what is really going on due to small sample size

Exercise
- Yes
- The exercise is currently in progress
- Not yet, but planning to do so in the future
- No, and currently not planning so either

The survey revealed that, of the public administrations surveyed, national agencies were most active in delivering initiatives promoting digitalisation. However, these survey results may not have adequately captured the full suite of initiatives at the local level simply because the survey focused on tourism organisations:

Tourism businesses add value to other kinds of businesses too. Digitalisation and new technologies help these larger processes. Tourism doesn't stand alone[15].

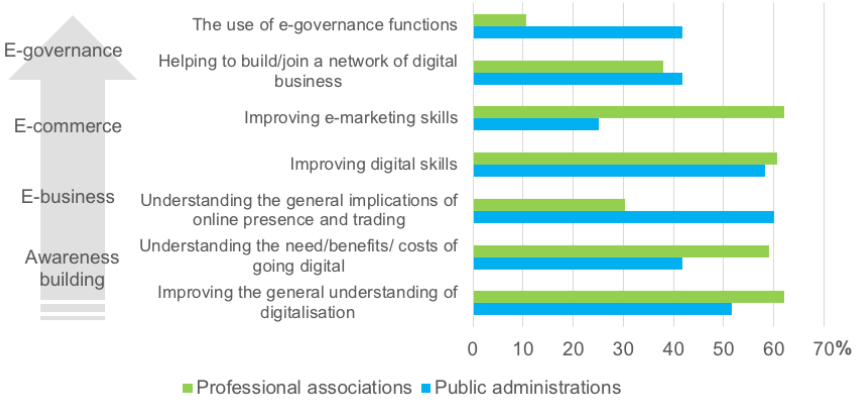
Information from interview data suggests that local DMOs are often the ones that work closely with SMEs through various programmes and funding initiatives, but these activities might not be visible because they are often funded and managed by multiple stakeholders:

Digitalisation is a process, not something that happens overnight, and DMOs will be there for the journey[16].

Survey data also revealed that professional associations operating at the national level were most active in supporting digitalisation, and there is limited activity by local level professional associations.

Public administration and professional association actions

Both public administrations and professional associations undertake education, networking, website support and e-marketing activities. However, the survey also revealed some differences in what both types of organisations offered. Public administrations were also involved in actions that contribute to the development of business ecosystems (e-commerce) and destination collaboration (e-governance) including, for example:



- Data collection
- Financial support
- E-governance assistance.

The main activities conducted by professional associations included:

- Educational activities
- Support for funding applications
- Building consortiums, matching, networking
- Support for marketing (websites, social marketing, online trading, etc.).

In addition to education, networking, and website support and e-marketing activities, survey data revealed that professional associations are involved in building e-marketing competences, and in developing e-commerce channels. They tend to be less involved in actions associated with building the skills, competences and connectivity required for e-governance (Q6 professional associations/Q6 public administrations).

The actions of both public administrations and professional associations in establishing collaborations between SMEs were found to be particularly important

Collaboration between SMEs is the joining of resources. It's human contact. Collaborative networking. Sharing ideas between SMEs. SMEs like to learn so they can keep going. For many regional tourism bodies, micro-entrepreneurs and self-employed businesses are not even considered part of the tourism system[17].

[15] Supplementary interview data by the current authors, DMO Digitalisation project manager.

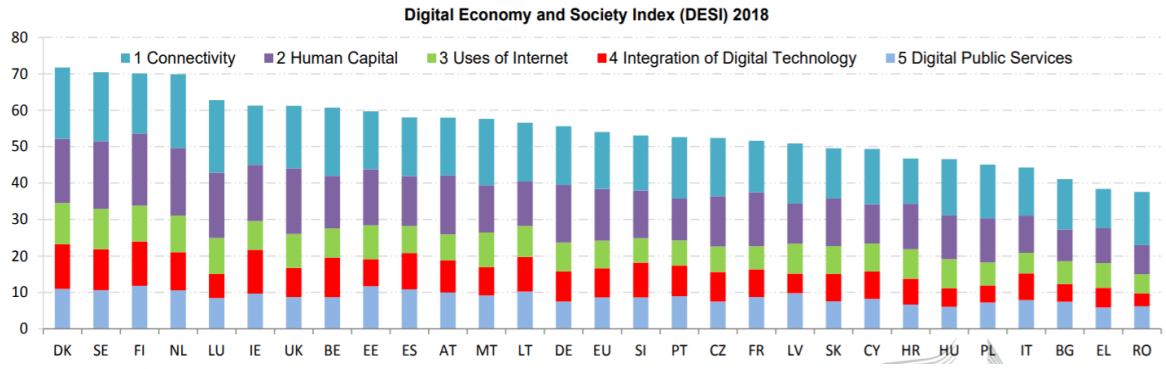
[16] Supplementary interview data by the current authors, National tourism organisation representative.

among micro-entrepreneurs and self-employed businesses. The demands of their business and limited visibility in regional tourism systems mean that networking opportunities, education and awareness raising actions have important social, economic and educational functions[17]. These actions have an important role in bringing these actors into the digitalisation process so they do not get left further behind.

Variations in level of digitalisation

Levels of digitalisation vary across Europe. The Digital Economy and Society Index (DESI)[18] summarises five key indicators of digital performance in Europe and is designed to benchmark progress towards digitalisation of member states. Regulatory frameworks, policy approaches towards economic development, innovation and entrepreneurship, labour policies, and even social welfare models can act to either support or slow down the progress towards digitalisation.

The DESI points to a broad pattern where the social models differ within Europe's welfare system. The DESI illustrates that Nordic countries demonstrate higher levels of digitalisation, and that Eastern and Southern European states are generally characterised by lower levels of digitalisation.



Source: Digital Economy and Social Index (2018)

Research comparing levels of digitalisation in Europe's welfare states in 2016 also revealed some significant differences between the aspirations and reality of digitalisation[19]. Average data speeds in broadband and mobile networks varied, as did the share of high-speed broadband connections. The Nordic countries (Sweden, Finland and Norway), Belgium, the United Kingdom, and to a lesser degree Germany, had above-average speeds in both broadband and mobile networks. Southern European states such as Greece, Croatia and Italy, as well as France demonstrated lower broadband and mobile speeds.

This discussion suggests that even before the geographic location of tourism SMEs (e.g. coastal, island, urban, mountain destinations) is considered as a determinant of digitalisation, the institutional context of member states also needs to be acknowledged[20].

The level of digitalisation, and possible solutions to the problems that SMEs are facing, are highly related to their geographical location. The specific needs of SMEs in local and regional contexts needs to be understood before solutions can be applied [20].

[17] Supplementary interview data by the current authors, micro-entrepreneurship and tourism researcher

[18] The Digital Economy and Society Index (DESI) (2018). https://ec.europa.eu/digital-single-market/en/desi

[19] Eichhorst, W., & Rinne, U. (2017). Digitalisation and the welfare state. CESifo Forum 4 / 2017

[20] Supplementary interview data by the current authors, Regional development agency representative.

5.0 Analysis - Digitalisation in tourism SMEs

Regional variations in digitalisation

Levels of digitalisation[21] were analysed using the widely accepted categorisation adopted by Esping-Andersen[22]. In this typology, the characteristics of welfare states were thought to explain how different institutional, socio-political and welfare characteristics affect the roles of government and policy making in general. Three main types were identified: social democratic (or Nordic) model; the corporatist (or Continental) model, and the liberal (or Anglo-Saxon) model, which highlight the way in which solidarity, equality and the market affect how governments respond to policy issues. Later, the Mediterranean (clientelism) and Eastern (post-communist) models were added[23]

Depending on the technologies that SMEs indicated that they were making use of (Q1 Digitalisation of your business), a measure of digitalisation for SMEs was generated for the five regions: Nordic; Continental; Mediterranean; Eastern European; and Anglo-Saxon (neoliberal)[24]. This analysis showed:

LEVEL OF DIGITALISATION (Q1)

	No. of SMEs	Low %	Medium %
Nordic/Social democratic	391	39.64	69.36
Continental/ corporatist	1,132	48.94	50.71
Mediterranean/ clientelism	649	44.07	55.62
Eastern/post-communist	582	56.53	43.47
Anglo-Saxon/ neoliberal	143	43.36	56.64
TOTAL	2,987		

- Tourism SMEs in Nordic countries tend to exhibit higher levels of digitalisation than other countries. Almost 70% of tourism SMEs in Nordic countries demonstrated a medium level of digitalisation.
- Around half of all SMEs in Anglo-Saxon, Mediterranean and Continental regions demonstrated medium levels of digitalisation in tourism.
- Eastern European countries appear to be lagging behind overall with 44% demonstrating medium level of digitalisation, although there could be some variation within these countries.

These findings suggest that historical and politico-institutional dynamics, and the policy traits that characterise these systems, may play a role in digitalisation. Higher levels of education, better access to digital technologies, the availability of a social welfare net, and higher public sector spending might all contribute to higher levels of digitalisation in Nordic countries compared to post-communist countries, for instance.

Some interviewees, while recognising the value of digitalisation, also cautioned against accelerating the pace of change where some countries, regions and contexts cannot, or do not want to keep up with the pace of transformation[25].

Digitalisation is a good thing, but it's not everything[25].

[21] The sample size for each member state was insufficient to undertake reliable in-depth analysis of the level of digitalisation in tourism in each country.

[22] Esping-Andersen, G. (1999). Social Foundations of Post-industrial Economies. New York: Oxford University Press.

[23] Kammer, A., Niehues, J., & Peichl, A. (2012). Welfare regimes and welfare state outcomes in Europe. *Journal of European Social Policy*, *22*(5), 455–471.

[24] The closed responses in the survey questionnaire did not include sufficient options to create a "high level of digitalisation" category. A high level of digitalisation would be those technologies from 2010 onwards (see above discussion).

[25] Supplementary interview data by the current authors, National tourism agency representative.

Type of technologies

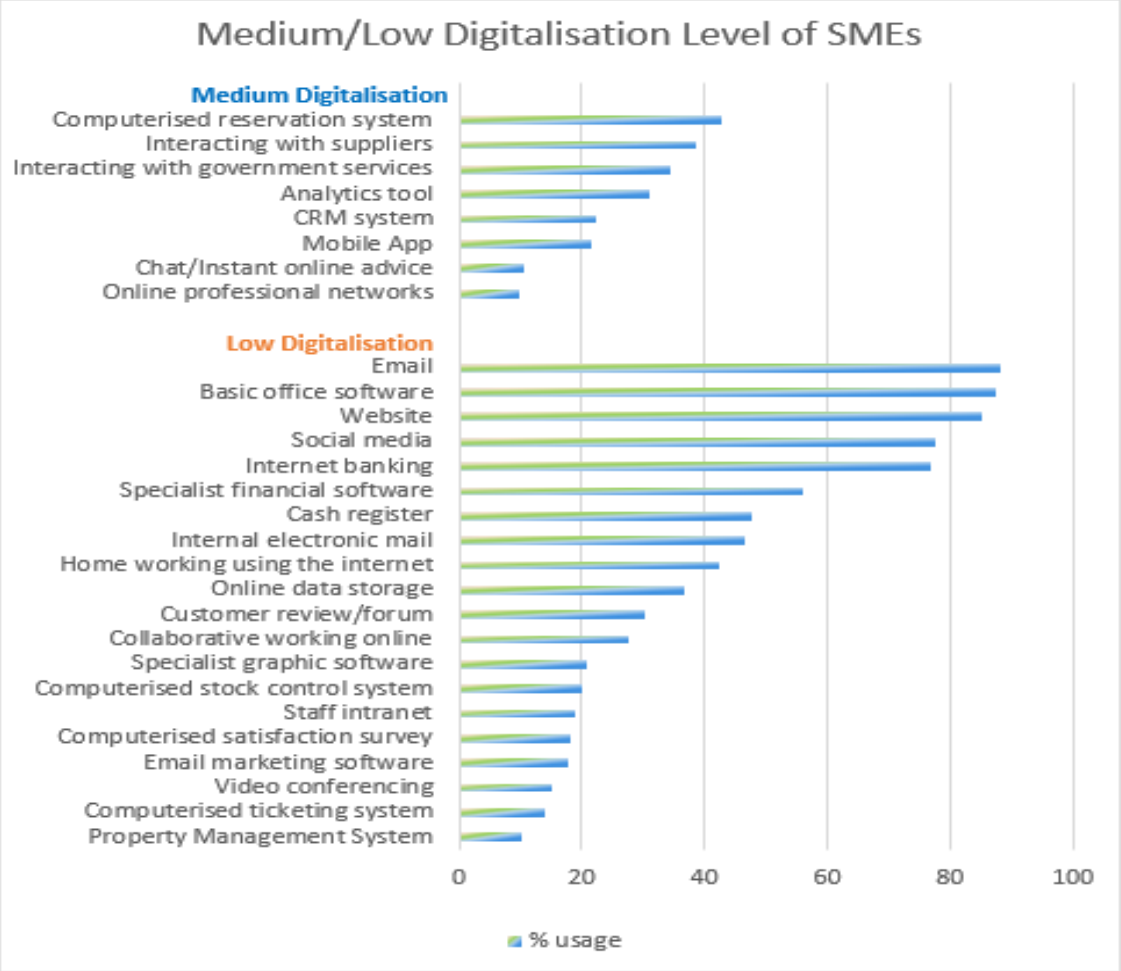
The survey asked SMEs about the technologies that they were currently using in their businesses (Q1). Results showed that tourism SMEs have incorporated many basic technologies associated with e-business into their operations. However, technologies associated with medium to higher levels of digitalisation were not as common.

There are some SMEs that are going well in their digital path, but there is also a "very big middle" of SMEs [20]. They don't have the time, money, or the incentive to digitalise. Perhaps they all don't need to.

This finding is consistent with observations from interview participants referring to the conservative character of tourism SMEs. Operators appear to be generally more conservative in implementing new technologies when the benefits are not immediately evident, and the current/traditional systems are working sufficiently well. This speaks to the old adage: "If it's not broken, then why change it".

Differences between SMEs characterised by low and medium levels of digitalisation.

Unsurprisingly, SMEs characterised by medium levels of digitalisation were interested in implementing new digital technologies because they had a **clear vision for the role of digitalisation** in their business.



Opportunities expected from digitalisation

The research survey revealed that the top 5 opportunities expected from digitalisation (Q3) reflect a focus on the potential for growth, improved market presence and expanded reach, and increased customer outcomes. These results corroborate the findings of previous research[26].

In a survey of 250 tourism SMEs in Europe in 2003, researchers previously found that European SMEs tend to view the advantages of digitalisation mainly in terms of e-business opportunities and market expansion. Mooted advantages in product innovation, new value creation opportunities, and expansion into global value chains were less cited. Nearly two decades after this study, the present survey indicates that SMEs still think of the opportunities associated with digitalisation in terms of relatively short-term, market-focused advantages. Potential opportunities for product development and innovation at both individual or collaborative levels, and opportunities from expanded and more efficient business ecosystems were less acknowledged.

Interview data tended to corroborate the opportunities of digitalisation identified in the survey data, but also offered additional insights:

- The advantages of digitalisation should be thought of as a supplement to SME business, and not an end goal.
- Opportunities of digitalisation should be thought of as multi-directional. Other businesses can get access to tourism, and tourism SMEs can generate value beyond tourism.
- The opportunities derived from digitalising SME businesses have not been translated into what this means for business clusters or ecosystems within a destination.
- Digitalisation enhances data collection, measurement, and has benefits for management.

Differences between SMEs with low and medium levels of digitalisation

Analysis revealed that SMEs characterised by low levels of digitalisation were significantly more interested in implementing digital technologies that increase customer retention, streamline internal processes, and improve service quality. Firms with a medium level of digitalisation were significantly more interested in digitalisation initiatives that would “expand business reach internationally”.

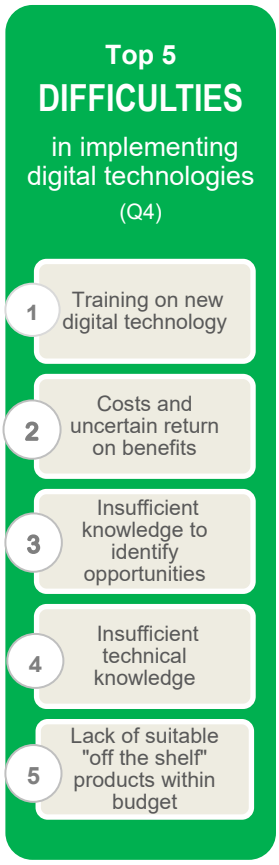
Sub-sector specific observations

In the **serviced accommodation subsector**, SMEs with low levels of digitalisation indicated that an expected advantage of digitalisation was to “expand business reach internationally”, a finding that likely reflects the disruption currently being caused by the rise of accommodation sharing platforms. SMEs with a medium level of digitalisation indicated that an important advantage of digitalisation would be to “allow new intermediaries to enter our market anywhere” indicating interest in new value creation potential from expanded business ecosystems.

In the **travel agent/tour operator subsector**, SMEs with low digitalisation were significantly more interested in the advantage of “increased profitability” from digitalisation and the “acquisition of valuable customer information”. This finding reflects the accelerated competition that characterises this subsector, especially as a result of disruptions from on-demand instant advice/chatbots, the influence of social media, and so on.

[26] Collins, C., Buhalis, D., & Peter, M. (2003). Enhancing SMEs business performance through Internet and e-learning platforms. Education and Training. (45, 8/9).

Difficulties experienced from digitalisation



The most prominent difficulty for tourism SMEs is the need for **training** following the introduction of a new digital technologies. SMEs often lack both human resources and the skills needed to digitalise, as well as resources (e.g. time, initial capital investment and ongoing, on-going technical support) required for training. The **costs**[27] of implementing new technology are cited as the second most important concern for tourism SMEs. This is unsurprising, as tourism SMEs tend to possess limited financial resources compared to large corporations. A large proportion of the sample size comprised small and micro-enterprises which are limited in terms of human and financial resources.

The top 5 difficulties together reflect concern over the lack of sufficient knowledge about digitalisation to make informed choices on new digital technologies.

Interview data tended to corroborate these concerns and offered further insights:

- Keeping pace with the rapid change in available digital technologies is a challenge, especially for small and micro-level businesses. SMEs feel under pressure.
- Skilled employees are needed in SMEs but also in DMOs and other agencies that provide assistance.
- Younger employers and employees can often adapt more readily to the challenging nature of digitalisation.
- SMEs do not often understand about the use and value of the data from digitalisation and how that can help their businesses and their business ecosystems.
- One of the biggest challenges of digitalisation is time. Being online, being able to respond to a customer request in a fast way is a full-time job. Time management and availability are important difficulties.

Differences between SMEs with low and medium digitalisation

Firms with lower levels of digitalisation were more likely to identify “insufficient knowledge” as a key difficulty in implementing digital technologies. SMEs’ lack of understanding about digital technologies can manifest as reactive responses to changing consumer needs and/or disruptions caused by new business models. Therefore, it is important that policies and actions that support increased awareness and education target the needs of SMEs with low and medium levels of digitalisation differently.

Analysis revealed that both SMEs characterised by low and medium levels of digitalisation perceived the lack of Commercial Off-The-Shelf Products (COTS) as a significant difficulty in their quest to digitalise.

Sub-sector specific observations

In the **serviced accommodation subsector**, SMEs with low levels of digitalisation indicated that “insufficient knowledge to identify opportunities” was a significant difficulty in implementing digital technologies.

In the **travel agent/tour operator subsector**, both low and medium/highly digitalised SMEs indicated that “insufficient technical knowledge” was a difficulty, although this was stronger amongst the medium/highly digitalised firms. Medium/highly digitalised SMEs also indicated “impacts on personnel practices” as a considerable difficulty, suggesting their concern for training and skill development.

[27] “Costs” were not specifically defined in the survey, but we might assume they infer the sum of financial costs which might relate to capital investment, labour costs, training, etc.

Reasons for improving digitalisation

The top 5 reasons that tourism SMEs gave for improving digitalisation reflect an optimism for the perceived benefits of digitalisation. The top two reasons "Improving online presence" and "Improving growth" reflect ambitions to grow, while the fifth reason "Improving networks" also suggests an interest in developing supply chains, and creating new value through involvement in broader business ecosystems.

The third reason "optimistic about future opportunities" suggests the high level of confidence that SMEs have in the opportunities afforded by digitalisation. This response sits in contrast to the observation above that SMEs generally lack sufficient knowledge and awareness of the opportunities of digitalisation. The fourth reason "Seasonality is a major challenge for my business" suggests that many SMEs see digitalisation as a way of reducing costs and improving access to the market place in order to address fluctuations in demand.

Interview data tended to corroborate and expand on these insights, including:

- Digitalisation enables new business models, logics and ecosystems. Digitalisation can enhance DMO-DMO, DMO-SME, and SME-SME ecosystems, increasing reach and accessibility of new products and experiences.
- Digitalisation can enhance interactions between subsectors – transport, accommodation, tour guides and do on.
- Digitalisation can address problems like crowding – digital collaborations can help to redirect tourists to other less crowded paths and open up less known experiences.
- Digitalisation can help collaboration, it can get SMEs around a "virtual table" to co-manage tourism, and in the process shift the focus to the SMEs as leaders not government.

Differences between SMEs with low and medium digitalisation

The only significant difference between SMEs characterised by low and medium/high levels of digitalisation was that firms with medium or higher levels of digitalisation were interested in further digitalisation because they had a "clear vision for the role of digitalisation". SMEs with lower levels of digitalisation did not appear to have this outward vision, and were mostly focused on motivations to address internal operational issues.

Sub-sector specific observations

Within **serviced accommodation sector**, SMEs characterised by low levels of digitalisation were motivated by the perceived advantages of "innovation", whereas SMEs with medium/high levels of digitalisation were more motivated by an emphasis on the "return on investment". This finding is consistent with the earlier observation that SMEs generally had a lack of knowledge about the opportunities and difficulties of digitalisation, and what it means for and beyond their businesses.

Perceived obstacles to further implementing digital technologies

In terms of obstacles to digitalisation in tourism SMEs, the **lack of financial resources** was perceived to be the key issue raised in 3 of the top 5 obstacles (Obstacles 1, 3 and 5).

A particularly interesting finding is Obstacle 2 that the attitude "current levels of technology are already sufficient" is an obstacle. While not a concrete "obstacle" like the availability of technology or human resource capabilities, an intangible obstacle is that many SMEs are questioning what is the most desirable level of digitalisation.

Interview data excavates this point illustrating that while traditional ways of doing things are still working, a key obstacle is deciding the level of digitalisation that would be appropriate in very context specific conditions:

- There should be a balance between traditional ways and digitalisation. SMEs operate in their own way and digital solutions have to supplement and enhance.
- Digitalisation is not the goal, better business is the goal.
- Technology needs to be refined and to fit the value being created, depending on the sub-sector, the context and location, not the other way around.
- Digitalisation is a good thing, but it is not everything.
- The smaller you are, the harder it is for you to use all these digital tools… it's a bit overwhelming.
- Digitalisation should make things easier. If SMEs feel under pressure to digitalise or to constantly answer to the technologies they have implemented and not their business, then this is not a good thing.

Obstacle 4 indicates a concern that technology is changing too rapidly, and that investment can quickly become obsolete. Obstacles 2 and 4 once again link to tourism SMEs' lack of understanding of digital opportunities, as well as how a business can best capitalise on these opportunities via clear strategies over both short and long term.

Improving awareness and understanding of the potential opportunities of digitalisation, both at an operational level and at business ecosystem level, is likely to facilitate innovation, new product development and new types of value creation. Public administrations and professional associations have a potentially important role to play in both passive awareness building and active solution building.

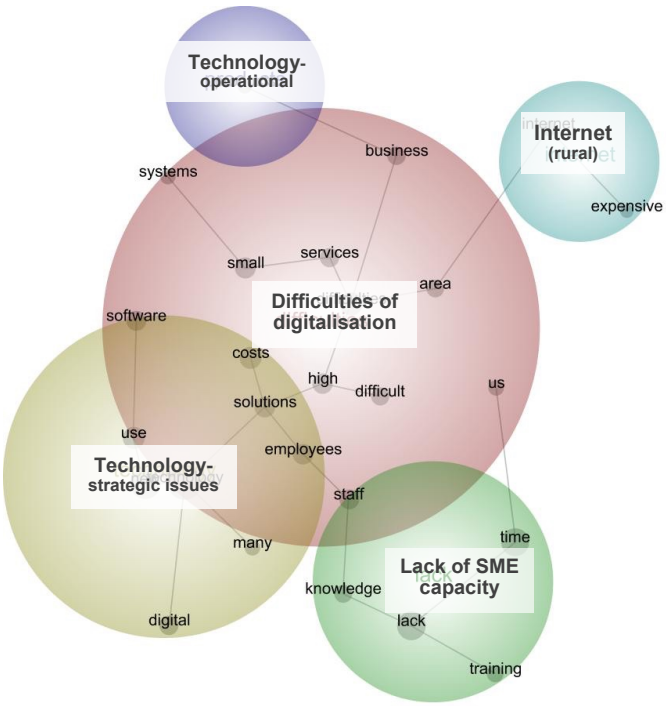
Differences between SMEs with low and medium digitalisation

There were no significant differences between SMEs characterised by low and medium/high levels of digitalisation. However, it is worth noting that both groups strongly disagreed with the statement *"My business is primarily to sustain a lifestyle and growth is of less importance"* (Q12). There is a sustained belief that many micro, self-employed and small businesses place lifestyle ahead of other business motivations such as growth. However, the survey results seem to indicate that both groups strongly believed that maintaining the micro/small lifestyle was not an obstacle to digitalisation.

SMEs with low levels of digitalisation were more concerned about the costs of high-speed broadband.

Summary of key issues

Drawing together the difficulties and obstacles identified by respondents in the survey, a semantic analysis was undertaken[28] based on the qualitative text data contained in open response question Q4.1. Semantic analysis examines the structure of phrases, sentences, clauses and words to gain an understanding of their meaning in context. In this analysis, five main clusters of challenges emerged from the data contained in the open ended question 4.1. The value of this analysis is that it transforms the tangible issues listed as difficulties, to also provide information on how these difficulties are clustered, interpreted and given meaning by SMEs.



1. **Lack of SME capacity** captures a cluster of challenges associated with being constrained by resourcing issues that are difficult to address - time, skills, trained staff, knowledge. Together, this "lack of…" is associated with a sense of anxiety over the costs, lack of time, staffing issues, need for investment, and so on.
2. **Technology - Strategic issues** captures a cluster of difficulties associated with the availability, cost, choice of possible technologies/ solutions that are available and the need to persuade staff/convince managers to adopt new technologies. It suggests that specific, technology-related decision-making is potentially an issue, and that decision support is needed to identify solutions efficiently and effectively.
3. **Difficulties of digitalisation** captures a cluster of comments that relate to the complexity of the problem space. It identifies difficulties including ICT hardware costs, ongoing maintenance costs, staff training costs, which are balanced against the size of the business, perceived benefits, other priorities, lack of affordable off the shelf solutions, and so on. These issues are complex, interrelated, and not easily actionable as individual difficulties. When taken together, they could be perceived as insurmountable and overlap with the anxious responses in the "technology" cluster. Within this "technology-strategic issues" cluster, the difficulties associated with rural areas are noted (coastal or island areas are not mentioned).
4. **Internet – (availability, cost, and reliability in rural areas)** captures, almost exclusively, a range of issues associated with rural areas including the availability and cost of infrastructure, poor Internet connections and issues with Internet service providers.
5. **Technology - Operational issues** captures a number of issues associated with suitable and appropriate technologies, including technical problems such as instability and virus protection, loss of data, outdated software, time and effort required to maintain online stores, and so on.

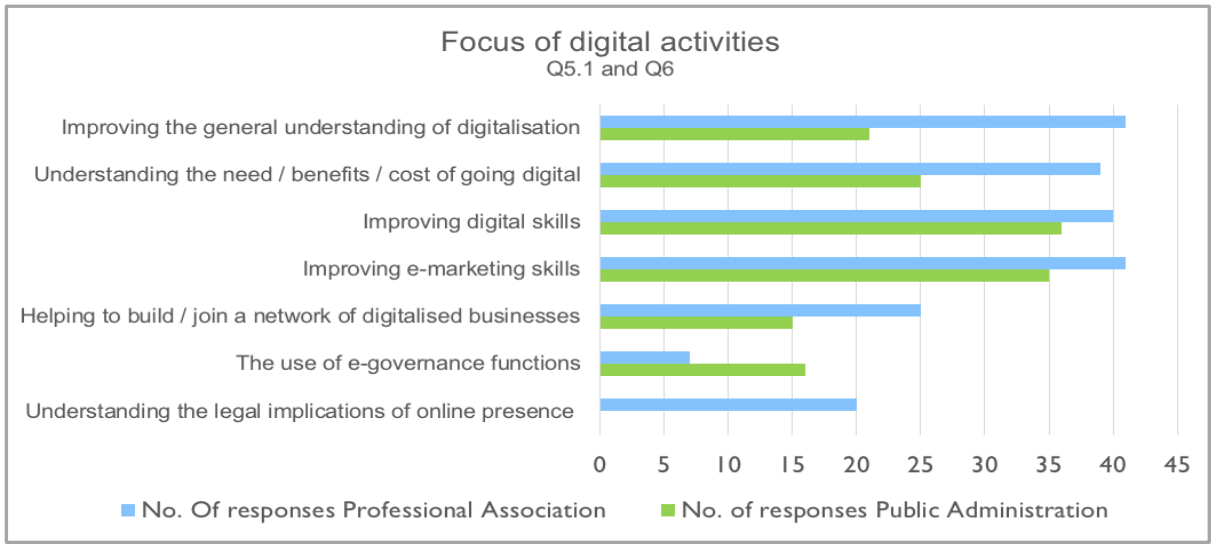
These challenges are not evenly experienced across Europe. Earlier analysis shows that opportunities, difficulties, obstacles and motivations are experienced differently within different subsectors and depend on the level of digitalisation that SMEs have already achieved.

[28] Leximancer was used to analyse open ended questions from Q4.1. The diagram is automatically generated based on the most commonly used words frequently used together and clustered to present meaning.

6.0 Analysis – Public administrations & professional associations

Activities of public administrations and professional associations

The survey gathered responses from 158 public administrations (n=73) and private associations (n=85) across Europe. Questions 5.1 and 6 asked what kinds of activities to support digitalisation were being undertaken. The results show that the main activities of the public administrations and professional associations surveyed include assisting SMEs improve their general understanding and awareness of digitalisation, and in improving basic skills. These activities could be classified as support for SMEs to adopt e-business practices. Support for building a network of digital businesses (e-commerce) and e-governance are more limited.

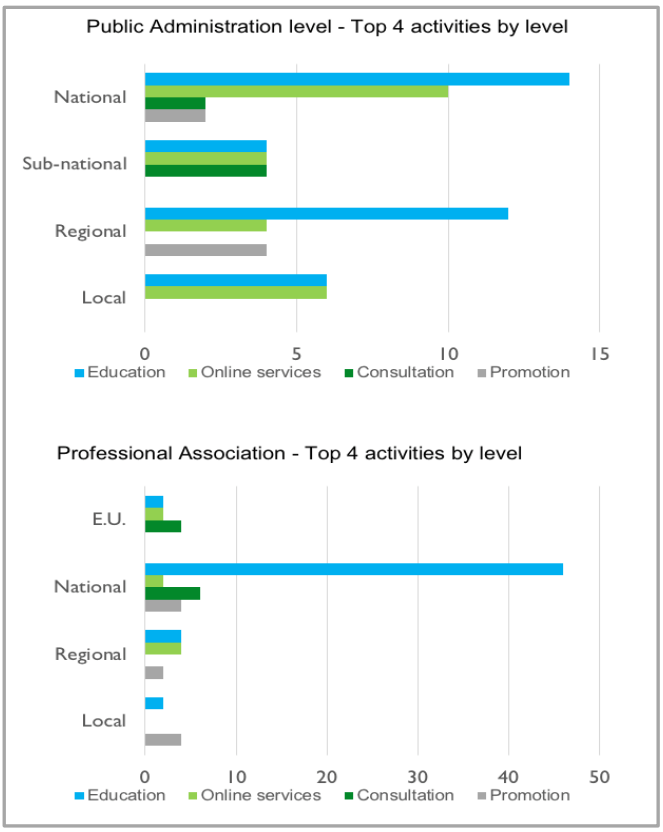


The data revealed that the top 4 activities to support SME digitalisation were: education, online services, consultation, and promotion.

Both public administrations and professional associations were predominantly engaged in delivering **education** activities. While the survey revealed no detailed information about the education programmes offered, given the relatively conservative nature of the sector, it is likely that these are targeted at awareness raising of e-business practices (marketing and online communication).

Interview data shed light on knowledge needs that should reach beyond basic digital skills[29]:

> *Digital skills development aside, we need to operate within a general innovation paradigm, and this is not necessarily about digitalisation*[29].

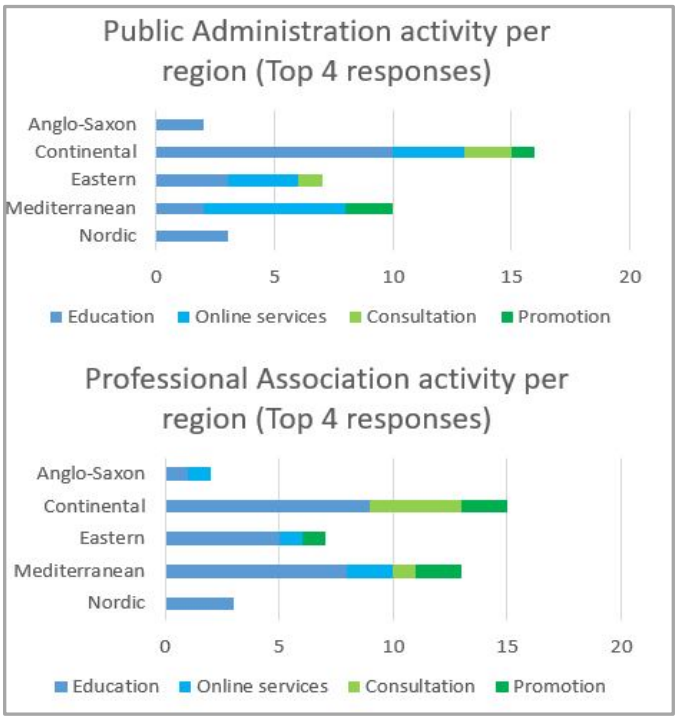


[29] Supplementary interview data by the current authors, local municipality representative.

Consultation activities do not appear to be provided by public administrations, most likely because this is thought of as best left to the private sector or professional associations. Interview data revealed that local administrations commonly co-fund research and development programmes aimed at mentoring, consortium building, grant writing, and identifying solutions which are delivered via partnerships with other levels of government and the private sector[30].

Collaborations DMO-DMO, DMO-SME and SME-SME are the key to finding solutions for the different problems that SMEs are facing. Well organised DMOs can be of help in providing that support.

Digitalisation programmes don't have value unless the industry is ready to take up those skills and insights[30].



Several of the DMO representatives interviewed highlighted that DMOs have an important role in creating the collaborative environment and preparing and nurturing the spaces of engagement, education and consultation in the destination environment.

The survey suggests that Nordic countries appear to receive only educational support even though the SME survey demonstrates that the region has some of the highest levels of digitalisation. This finding is inconsistent with the interview data, which uncovered several examples of extensive consultation, mentoring, education and prototyping initiatives. The survey sample included only a small number of local administrations (17%), and a more extensive survey of this group of stakeholders might reveal a greater variety of activities that are not included in the survey's closed question responses.

Interview data consistently pointed to the importance of bottom-up capacity-building initiatives, and collaboration across stakeholders at the local level was essential, especially with respect to **promotion** activities. Some interviewees also raised the importance of collaborating with large global stakeholders, and the important role that public administrations have in leading such initiatives[31].

Collaboration between governments, tourism organisations and third parties such as Facebook, Google, Airbnb and so on is needed because DMOs find it difficult to make these connections[31].

Do actions respond to the challenges of SMEs?

The survey data cannot provide any definitive answers as to whether current actions by public administrations and professional associations are responding in a targeted and effective way to the challenges identified in Section 5.0.

Obstacles	Difficulties
Lack of finance	Training on new digital technology
Current technology is sufficient	Costs and uncertain return on benefits
High training costs	Insufficient knowledge to identify opportunities
Rapid pace of technological change	Insufficient technical knowledge
Cost of high-speed broadband	

[30] Supplementary interview data by the current authors, DMO representative.

[31] Supplementary interview data by the current authors, DMO representative.

Survey data from public administrations and professional associations reveal a wide range of capacity building initiatives in education, support for online services (e.g. social marketing, website support, e-marketing and so on), which generally address the obstacles and difficulties identified in the SME survey.

Education and consultation activities offered by public administrations and professional associations can respond to the difficulties faced by SMEs by providing information to:

- Understand the extend, nature, size of the problem encountered by SMEs at either individual or collective levels;
- Assist in decision making by providing knowledge, decision support tools, and frameworks to assist SMEs and other stakeholders better appreciate the choices available and the strengths, weaknesses, costs and benefits of those options;
- Understand the transformational changes taking place at macro levels and how this can be translated into being relevant for SMEs.

While the actions of the public administrations and professional associations broadly address some of the challenges reported by the tourism SMEs, it appears that initiatives are performed in a relatively fragmented way, targeting specific needs and challenges of the SMEs in specific locations, and /or lead by dynamic individuals. There is a need to share understandings about what initiatives work best in what kinds of SMEs, in what locations/contexts, and to delve deeper and evaluate more rigorously the broad categories of actions included under education, consultation, and capacity building initiatives.

Interview data tends to support the need for more depth and coherence around the types of actions and initiatives, so that public administrations and professional associations can learn and better understand how to fine tune their work. Importantly several actors identified the enduring importance of face-to-face sharing of experiences, challenges and successes[32].

When you talk to SMEs, you talk to people, and you have to interact and learn at that level. That is the reality of tourism SMEs [32].

Is there a gap between the support provided and the needs of the industry?

The analysis of open-ended qualitative data (Section 5.0: Summary of key issues) identifies five key clusters of concern that highlight the managerial (i.e. strategic and operational) issues faced by SMEs. These issues capture the difficulties, pressures, insecurities, trade-offs, and challenges that SMEs encounter in managing their businesses and in making decisions about digitalisation. The pressure to digitalisation is one of many confronting SMEs who have limited resources, time, and often, bounded expertise.

- **Lack of SME capacity** (time, skills, staffing, knowledge, cost);
- **Technology-Strategic issues** (availability, choice, decision-making);
- **Technology-Operational issues** (suitability, availability and implementation of solutions within time, expertise and budget constraints).
- **Difficulties of digitalisation** (complexity of the digitalisation problem space);
- **Internet (**availability, cost, and reliability in rural areas);

There will always be a gap between the support provided by public administrations and professional associations, and what is needed. There will always be a need for extra hands. Collaboration is key to that[33].

Similarly, professional associations and public administrations are under increasing pressure to do more with less, and their capacities to bridge the gap between what SMEs need to support digitalisation and their organisational resources are also under pressure. These organisations could also benefit from shared knowledge and collaboration in the interests of supporting SMEs and their ecosystems.

[32] Supplementary interview data by the current authors, micro-entrepreneurship and tourism researcher.

[33] Supplementary interview data by the current authors, DMO representative.

7.0 Conclusions – Facilitating digitalisation

Approach to facilitating digitalisation

There is no "one-size fits all" Europe-wide set of policy responses given the diversity of tourism SMEs, the different institutional, economic, and social contexts, and multitude of actors and organisations involved. This report has aimed to diagnose the challenges and opportunities in order to help identify appropriate and targeted policy initiatives and actions.

Although there are variations across Europe, tourism SMEs are generally characterised by low level of digitalisation, with most of the technologies employed focused on facilitating internal SME e-business operations. There is some more limited use of technologies to facilitate e-commerce, and little evidence among the surveyed tourism SMEs that they are moving towards the level of connectivity and interoperability intended by terms such as smart tourism and e-governance.

The challenges of digitalisation emerge along three main vectors of transformation which broadly capture the journey from digitalising internal SME operations through to the development of digital supply chains and e-commerce, towards interconnected digital systems that support e-governance:

(1) At the SME **e-business level**, digitalisation and e-business practices can, for example, diversify and customise products, open marketing channels, leverage feedback mechanisms to increase market presence, increase operational efficiencies, and open up the innovation capacity of SMEs. Digitalisation can also reduce the cost of transactions and enable SMEs to extend into the global marketplace.

SMEs' progress towards digitalisation is also grounded in tensions between several factors:

- The choices of moving to new technologies and transforming business operations versus the reliability of known technologies and practices.
- The known and unknown costs of introducing new technologies versus the financial sustainability of the business.
- The unknown and unimagined benefits of digital transformation versus what is known, predictable and able to be planned for.
- The cost and difficulty of understanding and choosing technologies versus business as usual.

The continuation of policy initiatives and actions that support SME awareness of new technologies is important, especially given the conservative nature of the sector. In addition, initiatives could also support SMEs in their business planning and decision making with regards to new technologies.

(2) At the **e-commerce level**, digitalisation can increase connectivity, give rise to new business models, extend ecosystems, and new product developments. The expansion of digital platforms employing a range of business logics, and in a range of subsectors (e.g. accommodation, transport, food, guiding and personal services),

Challenges

Lack of SME capacity – SMEs are constrained by resourcing issues that are difficult to address - time, skills, trained staff, knowledge. Together, these issues can give rise to a sense of anxiety over SMEs' limitations.

Technology - Strategic issues – strategic issues associated with availability, cost, choice of possible technologies/ solutions that are available and the need to persuade staff/convince managers to adopt new technologies. Technology-related decision-making is a challenge.

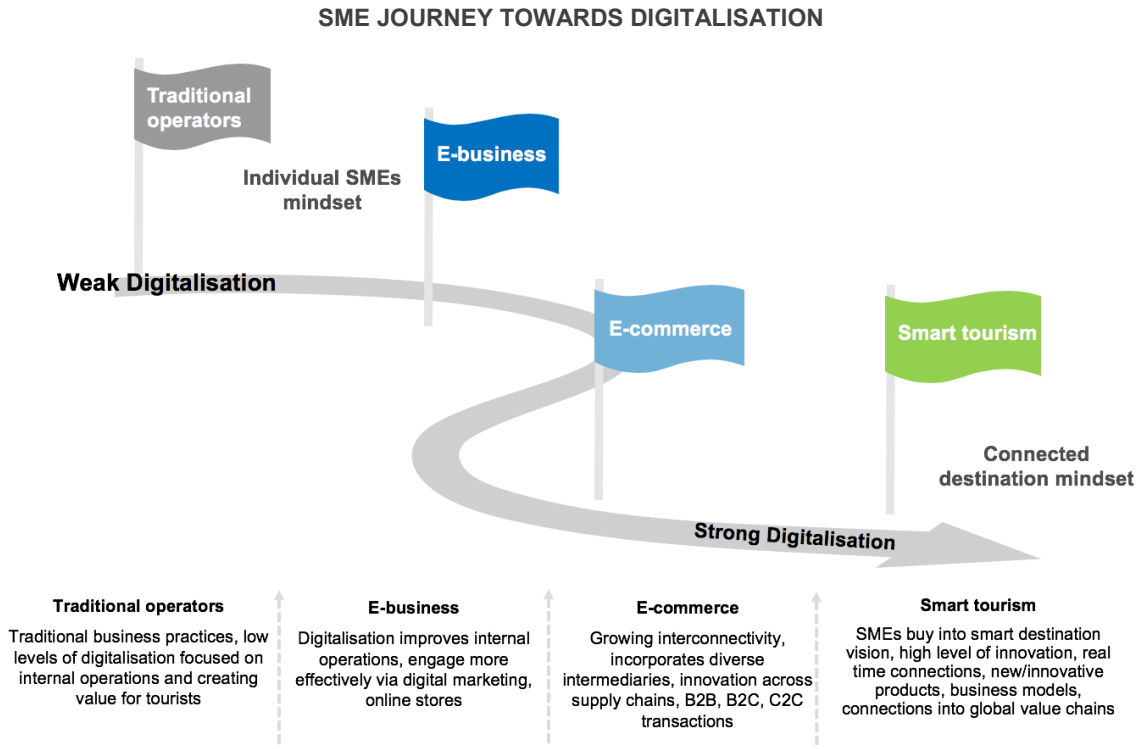
Difficulties of digitalisation - the complexities and trade-offs associated with diverse ICT and management challenges that are complex, interrelated, and not easily actionable as individual issues. When taken together, they could be perceived as overwhelming.

Internet - almost exclusively, a range of issues associated with rural areas including the availability and cost of infrastructure, poor Internet connections and issues with Internet service providers.

Technology - Operational issues - suitable and appropriate technologies, including technical problems such as instability and virus protection, loss of data, outdated software, time and effort required to maintain online stores, and so on.

illustrates both the innovation and the disruption caused by these models. Automated algorithms, machine learning and artificial intelligence have enhanced market awareness, and facilitated customised product offerings, which have in turn enhanced visitor experiences. At this sectoral level, digitalisation has also connected people and things in real time, which has streamlined decision-making and made transactions quicker, easier, and cheaper[34]. The challenges that SMEs face in transformation towards e-commerce require that, prior to choosing and implementing technologies, tourism networks and business ecosystem capacity need to be established.

Initiatives and actions at the e-commerce or ecosystem level could be addressed through network capacity building and mentoring programmes that increase connectivity between tourism, tech companies and extend ecosystems into other areas (e.g. arts and cultural sector). Programmes that connect SMEs' growth ideas with the latest research and knowledge possessed by tech companies can inspire innovative products and services development.



(3) At the **e-governance level**, digitalisation opens up opportunities for tourism organisations and public agencies to seize the opportunity of big data, to collect and analyse data in real time, with the aim of improving the efficient and effective use of resources. The development and sharing of resources at a strategic level requires a high level of digitalisation at the operational level within SMEs; it requires a highly connected, networked sector; and it requires shared vision, trust and willingness to work together. Cloud technologies, digital platforms, and on-demand connectivity can facilitate both self-governance and public-private governance. However, the development of e-governance and, ultimately, any progress towards **smart tourism** relies on the development and nurturing of collaborative network relations. Policy initiatives aimed at development of e-governance and, eventually smart tourism, should be targeting network capacity building in and alongside technological advances such as opportunities to implement platform technologies, data collection and analysis capacities.

[34] Dredge, D. & Gyimóthy, S. (2017) *Collaborative Economy and Tourism: Perspectives, politics, policies and prospects*. Springer Publishing, Cham.

Specific measures to facilitate digitalisation

The European Commission has taken steps to facilitate a European-wide policy response to foster a competitive single digital market. However, these initiatives must also be met with local creativity, innovation, and empowerment of local businesses and business networks. The principle of subsidiarity provides the guidance in achieving a balance between top-down and bottom-up support.

Policy initiatives and actions that address e-business, e-commerce, and e-governance/smart tourism levels could be framed around four major mechanisms: (1) Network expansion; (2) Technical assistance; (3) Financial assistance; and (4) Research and development.

(1) Network capacity building

Specific policy responses could involve the continuation of network capacity building initiatives already being undertaken by professional associations and local public administrations.

Capacity building networks need to include stakeholders beyond tourism, including tech companies and other complementary actors (e.g. arts and culture, creative industries, etc.).

At the individual SME level, tourism operators are challenged to find the necessary resources to innovate, and at the same time, meet their business objectives. Network capacity building should broaden all forms of collaboration or co-operation both territorially and along the value chain.

Capacity building initiatives should seek to build consortiums, and build SME platforms that connect SME members. Such initiatives should aim to support peer-2-peer mentoring and training, as well as networking and collaborative opportunities that can transform the business/sector. Business-2-Business platforms should be interoperable with larger online distribution companies in order to extend their products and services in more destinations and in broader markets. Professional associations representing the different sectors play an important role as do DMOs in bringing together diverse stakeholders and building the required capacity.

Local and regional level public administrations also have an important role to play in these initiatives given their deep knowledge of the local context and conditions.

(2) Technical assistance

Education

Currently, the support provided by public administrations and professional associations to SMEs has a strong focus on education. These educational activities appear to be mostly passive, and seek to improve general knowledge on digitalisation (e-g. via webinars, newsletters, information sessions). Quite the reverse of helping to build awareness, passive education opportunities could help to confound and confuse small and micro-business owners, especially those in older age groups, and perpetuate the perceived challenges of digitalisation. There may be a need to rethink education approaches in some contexts, to deliver more **interactive sessions** that include in-depth discussion of, for example:

- the different stages of digitalisation and strategies to move from traditional business, to e-business, to e-commerce, and to smart tourism.
- the diverse digital technologies that can be leveraged to improve both SME productivity at an operational level, and collectively, at a destination management level (e.g. big data, mobile app, interconnectivity and Internet of Things, virtual reality, etc.).
- the cost versus return on investment of digitalisation. Importantly, the broader benefits of digitalisation should be highlighted to enable small-medium tourism enterprises (SMTEs) to make more informed decisions, taking into account not only

***Technical assistance** is non-financial assistance provided by local or international specialists. It can take the form of sharing information and expertise, instruction, skills training, transmission of working knowledge, and consulting services and may also involve the transfer of technical data.*

monetary return but also potential long-term intangible benefits such as improving efficiency, control, collaboration, data quality etc. Through opening up discussions on long-term impacts, SMTEs may be more willing to invest into digitalisation activities.

Beyond broad educational opportunities, **advisory and consulting services** are important to address specific needs of individual SMEs. There is some question as to whether public administrations, professional associations or the private sector is best suited to provide such services. The survey data revealed that only a few countries currently provide these services. Advisory and consulting services could:

- Assist individual tourism SMEs develop their own digital strategies/plans that best suit their current stage of digitalisation and existing resources. These digital strategies should not be stand-alone but also focus on strategies for integration into existing digital supply chains.
- Assist individual tourism SMEs to develop appropriate training plans to acquire new digital skills that are in line with destination or sector-level digital strategies. Such training plans can help SMEs to identify gaps in current and future skills as well as exploring the range of options on how to address this gap. Some of the options include recruiting external talent, outsourcing, e-learning, pooling resources and sharing training cost among SMEs with similar training needs.
- Provide advice on specific technologies that SMTEs can leverage at different stages of their growth.

Skills training

Training needs to be differentiated and targeted to different groups of SMEs including those that just start to digitalise and are moving into e-business; those that are in transition to e-commerce; and those that are highly digitalised and experimenting with new technologies. The European Commission[35] shows that skills for digital marketing, social media, web development, cybersecurity, and data analytics are where most SMEs seek to improve. Currently, most public administrations and professional associations in the survey seem to focus on basic training opportunities for tourism SMEs such as digital skills for online promotion (e.g. website development, social networking), and sales (e.g. online booking systems and customer management). There is a need to develop training programmes that align with broader challenges currently facing SMEs in general (e.g. upskilling in cybersecurity and data analytics), especially programmes that support SMEs with higher levels of digitalisation (e.g. human-centered design, and prototyping of new products)[36].

Other research funded by the European Commission[37] finds that while SMEs can acquire digital skills from government-sponsored programmes and vocational/universities' programmes, some find it more useful and valuable to learn directly from relevant industry experts and peers. A successful training framework therefore needs to have a balance between formal training and semi-formal/informal training through SME peer-to-peer programmes.

Besides direct skill training programmes targeting SMEs, further research is needed to identify more specifically the digital skills that are important for SMEs in the future. This could help to guide university and vocational programme development to supply the workforce with graduates that have relevant digital skills, in turn further reducing the cost of training staff for SMEs over time. 'Studies conducted by Empirica found that there is a need for both formal educational qualifications and shorter, more targeted, affordable training opportunities, with flexible schedules to accommodate micro and small enterprise workers[38].

Skills development opportunities tailored to specific needs include:

- the operational needs of individual SMEs to transition to e-business and e-commerce; interconnectivities in the transition towards smart tourism;
- contexts, subsectors of tourism (e.g. accommodation, transport, personal services).

[35] https://ec.europa.eu/digital-single-market/en/news/upskilling-europes-small-businesses-digital-age

[36] https://www.strategyand.pwc.com/reports/preparing-digital-era

[37] https://digital.di.dk/SiteCollectionDocuments/Publikationer/DigitalskillsforSMEs.pdf

[38] https://ec.europa.eu/digital-single-market/en/news/upskilling-europes-small-businesses-digital-age

(3) Financial assistance

***Financial assistance** is monetary assistance, such as tax breaks, grants, or private donations, SMEs receive with the purpose of reducing the burden of investment in order to foster innovative solutions and digital competencies.*

Various targeted policies exist that provide financial assistance to support SMEs. The Amsterdam government, for instance, encourages innovation in SMEs via tax credit and tax relief, grants, government guarantee for part of the loans, microloans of up to 50.000 euro[39] . These policies could be adapted to cater for and incentivize digitalisation in tourism SMEs.

In relation to the challenges identified above, financial assistance could help to cover part of the training costs and other related-cost to improve digitalisation in SMTEs. The assistance should also help to improve of access to off-the-shelf digital solutions. For example, the Singaporean government supports digitalisation via the identification of 50 relevant technical solutions, piloting them on a small number of SMEs then providing other SMEs with initial funding to adopt relevant solutions[40]. For SMTEs that operate in remote and periphery areas, financial assistance can also be used to support the development of infrastructure to permanently cut cost of broadband and mobile services.

(4) Research and Development

***Research and Development** focuses not only on the creation of new tourism services and products but also on developing new functions, processes and business models through the innovative use of digital technologies.*

Research and Development (R&D) and innovation are key components of the Europe 2020 Strategy wherein innovative products and services contribute to the strategy's smart growth goal, and also to its inclusiveness and sustainability objectives[41]. In tourism, the benefits of digitalisation exist on a continuum which scale from the individual operational SME level through to the collective synergies created by inclusion in digital supply chains through to global value networks. The European Commission is particularly interested in promoting the digitalisation of SMEs as a step in integrating them into broader economic value chains[42]. R&D and innovation can also be useful for finding solutions to particular tourism-related societal challenges including, for example, challenges associated with seasonality, overtourism, and sustainability in tourism.

R&D and innovation actions that encourage digitalisation in tourism SMEs may include the following:

R&D in tourism product development for SMEs

- R&D aimed at collecting and analysing data to assist to automate and streamline operations within tourism SMEs;
- R&D aimed at understanding markets, customer behaviour, sales and decision-making specific to tourism global value chains;
- Develop affordable off-the-shelf solutions (COTS) for tourism SMEs;

[39] https://www.government.nl/topics/enterprise-and-innovation/support-for-small-and-medium-sized-enterprises-smes

[40] https://www.businesstimes.com.sg/government-economy/singapore-budget-2017/over-s80m-set-aside-to-help-smes-go-digital

[41] Eurostat 2020 indicators - R&D and innovation. (2018). https://ec.europa.eu/eurostat/statistics-explained/index.php/Europe_2020_indicators_-_R%26D_and_innovation#Key_messages

[42] European Union SMEs in Global Value Chains. (2016). https://ec.europa.eu/growth/content/eu-smes-global-value-chains-0_en

- R&D collaborations between ICT vendors and SMEs to design and implement solutions with the potential to scale[43].
- R&D aimed at identifying and overcoming barriers to adoption of new and innovative technologies by partnering with the private sector to drive technology transfer[44].

R&D connecting SMEs in and beyond destinations to global value chains

- R&D to design and pilot digital solutions with the potential to scale;
- R&D to catalyse the use of digital technology solutions that can potentially benefit the entire sector;
- R&D assisting SMEs partner with large data rich corporations such as telecommunications companies, banks and professional firms to put together comprehensive digital solution packages for SMEs;
- Extend product development at a destination level through development and adoption of interactive Tourism Recommender Systems (TRS) that help users plan their multi-day trips[45].

R&D in business logics for digital tourism

- R&D in new digital business logics and global supply chain opportunities.
- Support innovation in digital platforms taking into account shifts in social preferences and consumer demands (e.g. increased interest in pro-commons platforms, sharing and alternative forms of exchange, increased interest in the sustainability dimensions of tourism products).

R&D for digital education and skills development

- Research is needed to understand the specific knowledge needs of SMEs so that education and skills development and training programmes can be appropriately targeted. The development of education and training should employ pedagogic tools and frameworks to ensure active learning, hands-on solution building, as well as passive awareness and information dissemination.

R&D targeting regional and local support

- Working with current initiatives that seek to support and facilitate digital economy transformations, include tourism as a distinct sector in national and regional digital strategies, incorporating tourism as part of research and technological development (RTD) policies.

R&D targeting Commercial off the shelf products

The analysis also highlights a lack of suitable Commercial Off-The-Shelf (COTS) product solutions within budget to support digitalisation. COTS are packaged solutions that can be easily adapted to satisfy the needs of purchasing organisations[46]. There exists a wide range of COTS solutions in tourism, often in the form of Software as a Service (SaaS) or Service-Oriented Architecture (SOA)[47].

- Tourism SaaS such as online reservation or customer relationship management systems could be hosted on the cloud and delivered entirely via the web, in turn significantly reducing the costs SME face in relation.

[43] For example, Singapore's InfoComm Media Development Authority (IMDA) now has 50 pre-approved digital solutions for SMEs seeking reliable and proven tech solutions. https://www.imda.gov.sg/about/newsroom/media-releases/2017/pre-approved-digital-solutions-for-smes-to-seize-new-growth-opportunities

[44] For example, the Singapore Government drives technology adoption in SMEs through two initiatives, the Growing Enterprises through Technology Upgrade (GET-Up) and the Technology Adoption Programme (TAP). https://www.a-star.edu.sg/News-and-Events/News/Press-Releases/ID/4992

[45] Sebastia, L., Yuste, D., Garcia, I., Garrido, A. & Onaindia, E. (2015). A highly interactive tourism recommender system for multi-day trips. Available: http://deim.urv.cat/~itaka/workshops/recsys2015/Files/ProceedingsTouRS15.pdf

[46] McKinney, D. "Impact of Commercial Off-The-Shelf (COTS) Software and Technology on Systems Engineering", *Presentation to INCOSE Chapters*, August 2001.

[47] https://www.iby.it/turismo/papers/TOURISMlink_MktReport_V2.pdf

to technological infrastructure. Traditional SaSS however often suffers from a 'lack of fit' as they are difficult to modify and integrate with other systems[48].

- SOA provides SMEs with opportunities to cut cost further through splitting a package into smaller units and allow the businesses to remove or add the functions needed depending on their stage of growth. Modern SOA-based tour operator systems also support the flexible combination of services, providing a one-stop-shop for booking tours, hotels, transits, etc[49].

The use of popular COTS solutions may also help to reduce the need for training, as many are "plug-and-play" and seasonal staff in the tourism industry may already be familiar with them via previous employments. Yet despite their importance to SMEs in Europe, most tourism COTS developments are targeted towards medium and larger enterprises.

Conclusion

Tourism is a key component of the European economy and will continue to be in the future. There are over 2.3 million SMEs in tourism in Europe estimated to be directly employing some 12 million people. A major transformational force within the tourism sector is the digital economy, which is driving a new phase of growth and development in Europe's tourism regions.

A large proportion of these SMEs are relatively conservative in their business approaches, and there exists very diverse attitudes and challenges with respect to digitalisation in tourism. This report has shown that the difficulties and obstacles SMEs encounter or perceive are largely concerned with SMEs' individual business circumstances. Cost, lack of knowledge, and the availability of technical knowledge are key concerns. SMEs are able to see the opportunities, especially in terms of more efficient business practices and market expansion, and they are motivated to implement digital solutions to increase their competitiveness, to grow and expand their networks.

However, this report also found that digitalisation brings many challenges for SMEs, particularly in terms of their practical capacities. SMEs themselves noted challenges around their lack of time, skills, trained staff and knowledge. They noted both strategic and operational challenges with respect to choosing and implementing technologies, with the complexity of decision making and how to navigate the digitalisation space making them anxious, especially given their tendency towards conservative business practices. Participation in digital tourism is particularly important in rural areas, where SMEs often experience additional challenges. The diversity and complexity of tourism's sub-sectors, the different challenges in urban, rural, and island destinations, and the different challenges that manifest in different institutional systems across Europe, present capacity-building and regulatory challenges for the digital tourism ecosystem.

The conversation so far about digitalisation in tourism has focused on the imperative to digitalise tourism businesses. Qualitative data collected as background to this report reminds us that tourism is part of a larger ecosystem and that the focus on tourism can divert attention away from the wider ecosystems that tourism contributes to and is part of. It is important to take an ecosystem perspective to digitalisation, and acknowledge that digitalisation in other sectors may indirectly assist tourism and can have important flow on effects in tourism. Building and sustaining ongoing opportunities for hands-on learning, sharing experiences, and spaces of cross-sectoral creativity FOR tourism are just as important as a focus on digitalisation IN tourism.

[48] https://rezervlinx.com/smart-tourism-and-saas/

[49] http://www.isogmbh.com/services/travelsoftware/hotels-travel-supplier/tourism-software-based-on-soa.html

Appendix A. Analysis – Additional information

Additional information - The measure of medium and low levels of digitalisation in SMEs

A digitalisation score was computed from question 1: "Does your business currently make use of the following digital technologies in your business?" For each entry, options considered as "low level of capability" are assigned 0.5 while options considered "medium level of capability" are assigned 1.0. The sum of all options chosen was the 'Digitalisation score'. Categorisation as either medium or low was based on whether the digitalisation score was above or below the median, which was the 50th percentile of the Digitalisation score.

Based on Q.1 of the SME questionnaire "Does your business currently make use of the following digital technologies?", the following set responses were categorised as medium and low levels of digitalisation.

Low Digitalisation	Medium digitalisation
Basic office software	Interacting with suppliers
Specialist financial software	Interaction with government services online
Specialist graphic software	Customer Relationship Management System
Computerised stock control system	Analytics tool (e.g. Google Analytics, etc.)
Internal electronic mail	Computerised customer reservation system (web booking engine)
Staff intranet	Mobile App
Online data storage (e.g. Dropbox)	Chat / instant online advice
Collaborative working online	Online professional networks
Video conferencing	
Internet banking	
Home working using the internet	
Cash register	
Property Management System	
Computerized ticketing system	
Computerized customer satisfaction survey	
Website	
Email	
Social media	
Customer reviews/Customer forum	
Email marketing software	

(Source: European Commission – Questionnaire for Businesses)

Low-level digitalisation is characterised by digital tools and practices that assist with the internal management and daily running of the SME. Knowledge sharing and communications tend to be unilateral.

Medium-level digitalisation is characterised by tools and practices that improve both the effective management of the SME, and its connection with value chains (consumers, suppliers, industry networks, etc.). Communications and knowledge sharing are multi-directional/shared.

Country Classifications

The list of nations from which the surveyed SMEs responded have been given geographic classifications to assist with analysing broader social and economic characteristics across Europe. The countries listed below are derived from the available responses to Q.2 "The country of operation of your business" from the European Commission's questionnaire for businesses. Each nation has been assigned to one of 5 possible geographic categories: 1) Nordic 2) Continental 3) Anglo-Saxon 4) Mediterranean 5) Eastern

Nordic	Continental	Anglo-Saxon	Mediterranean	Eastern
Denmark	Austria	Ireland	Cyprus	Albania
Finland	Belgium	United Kingdom	Greece	Bulgaria
Netherlands	Croatia		Italy	Estonia
Sweden	Czech Republic		Malta	Latvia
	France		Portugal	Lithuania
	Germany		Spain	Macedonia F.Y.R.
	Hungary		Turkey	Montenegro
	Luxembourg			Romania
	Poland			Serbia
	Slovakia			
	Slovenia			

(Source: European Commission - Questionnaire for Business)